

OpenPCS Quick-Start Instructions

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Table of Contents

1	Introduction	7
2	Software Installation	7
2.1	Installation of the CAN-Interface	7
2.2	Preparations for Installation of OpenPCS	7
2.3	Installation of the OpenPCS Programming System	8
3	OpenPCS Project Compilation and Download	10
3.1	Starting OpenPCS and Opening a Project	10
3.2	Creating a new Target Connection	11
3.2.1	Using UDP/IP	13
3.2.2	Using CANopen	14
3.2.3	Using RS232	17
3.3	Assign the connection to the PLC resource	19
3.4	Compile the Project	19
3.5	Downloading the Program to the PLC Device	20
4	Running and Debugging the PLC Program	21
4.1	Run a PLC Program	21
4.2	Debug the PLC program	22
4.2.1	Using a Breakpoint	22
4.2.2	Using the Watchlist	24

List of Tables

List of Figures

Figure 1: OpenPCS Driver Utility Setup	8
Figure 2: SYS TEC OpenPCS Extension select components dialog	9
Figure 3: SYS TEC OpenPCS Extension Setup	9
Figure 4: End of SYS TEC OpenPCS Extension Setup	10
Figure 5: Target Connection - Edit Connection	11
Figure 6: Target Connection - Select Driver	12
Figure 7: Edit connection.....	12
Figure 8: Connection Configuration for UDP/IP	13
Figure 9: UDP/IP - Select Remote Address	13
Figure 10: UDP/IP - Target Connection (filled).....	14
Figure 11: Connection Configuration for CANopen.....	14
Figure 12: CAN Hardware Setup.....	15
Figure 13: CANopen - Hardware Properties	15
Figure 14: CANopen - Hardware Specific Parameter	15
Figure 15: CANopen - Selecting Node	16
Figure 16: CANopen - Select Node Address.....	16
Figure 17: CANopen - Target Connection (filled)	17
Figure 18: Connection Configuration for RS232	17
Figure 19: RS232 – Select Network Settings	18
Figure 20: RS232 - Target Connection (filled).....	18
Figure 21: Resource Properties.....	19
Figure 22: OpenPCS - Rebuild Active Resource	20
Figure 23: Download – Confirmation	20
Figure 24: Start resp. Stop the PLC Program	21
Figure 25: Toggle a Breakpoint	22
Figure 26: Toggled Breakpoint	23
Figure 27: Stop at break point	23
Figure 28: Continue at Breakpoint.....	24
Figure 29: Resources View	25
Figure 30: Add To Watchlist	26

1 Introduction

This Quick-Start manual describes the necessary steps for starting up a SYS TEC controller subassembly in combination with the IEC61131 programming system OpenPCS. The aim of this manual is to enable the first time user to start up all necessary components.

2 Software Installation

The following steps will summarize the setup of a CAN interface and guide you through the installation of the OpenPCS programming system and the SpiderControl PLC Editor at the development computer. These Quick-Start instructions were tested on a PC running Microsoft-Windows 7.

2.1 Installation of the CAN-Interface

The steps described in this section only have to be done for PLCs communicating with OpenPCS via CANopen. If your control unit uses another protocol please continue with section 2.2.

Step 1:

- Switch off your PC and connect the CAN interface to your PC. More detailed instructions on how to do this can be found in the manual to your CAN interface. The following CAN-Interfaces are supported:
 - SYS TEC USB-CANmodul (GW-002)
 - SYS TEC CAN-Ethernet-Gateway (GW-003)

Step 2:

- Start your PC and install the driver for the CAN-Interface you are using. Be sure that you have selected the correct driver for the operating system.

2.2 Preparations for Installation of OpenPCS

Because of the user account control (UAC) problems with the installation/uninstallation of OpenPCS on computers with Windows 7 may occur. In this case please change the adjustments of the user account control, described as follows:

1. Open the Windows Control Panel
2. Input "UAC" in the search field on the top right
3. Select: "Change settings of the user account control"
4. Move the slider to the lower position "never inform"
5. Restart the PC to apply the settings
6. Start the installation/uninstallation of OpenPCS
7. After completed installation/uninstallation switch the controller of the "UAC" back to the previous position
8. Restart the PC again to apply the settings

2.3 Installation of the OpenPCS Programming System

Regard:

Before starting the installation of OpenPCS please read section 2.2 to prevent errors during the installation process.

Step 1:

- Run the OpenPCS setup program (e.g. "PS702e.exe", the correct name depends on the current version) as Administrator and follow the self-explanatory instructions until the following dialog window appears:

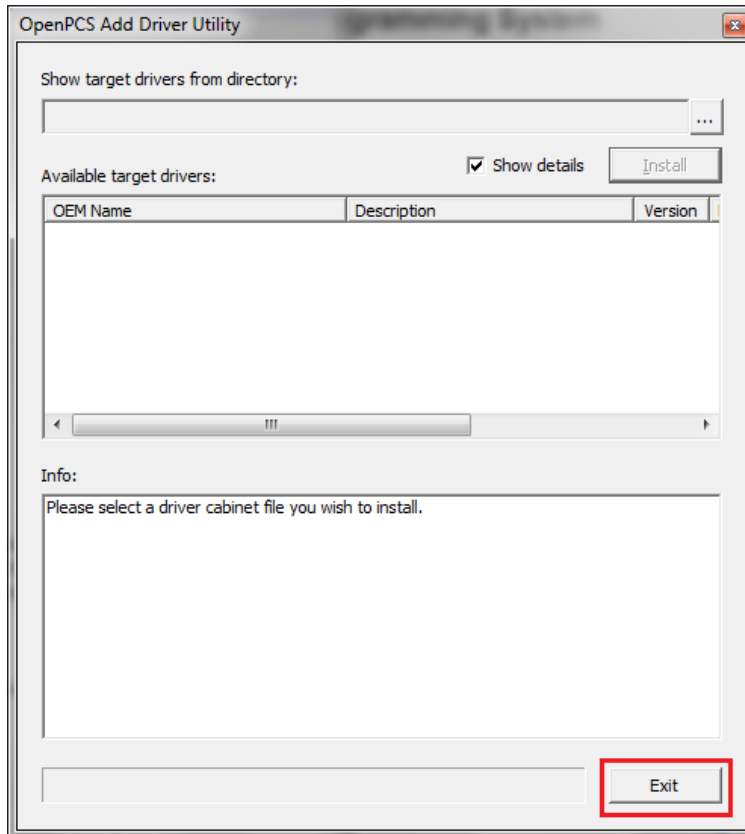


Figure 1: OpenPCS Driver Utility Setup

- At the moment no driver has to be added. All necessary drivers needed for the PLC will be installed with the "SYS TEC Extension" (see Step 2 below). So just click "Exit" and after a short while the installation procedure is finished.

Step 2:

- Start "SYS TEC Extension" (e.g. "SYSTEC-OpenPCS-Extension_702e_100.exe", the correct name depends on the current version). Follow the instructions of the install utility.
- The "Select Components" dialog appears. If you want to create graphical user interfaces (your target must support this) then please enable the "Spider Control HMI Editor" checkbox and choose the HMI Editor version you have licensed (Economy, Standard or Extended) as shown in the dialog below.

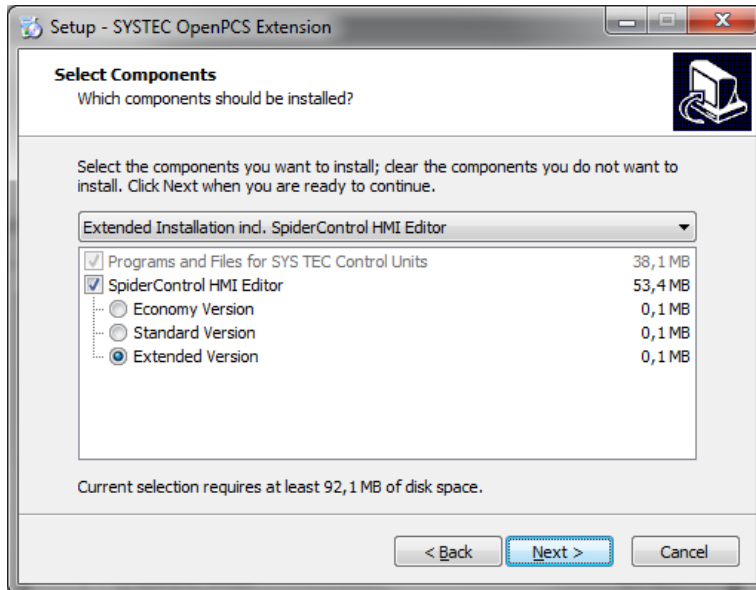


Figure 2: SYS TEC OpenPCS Extension select components dialog

Confirm this by clicking “Next” button.

- The licenses shown in the dialog-box are only for your information.

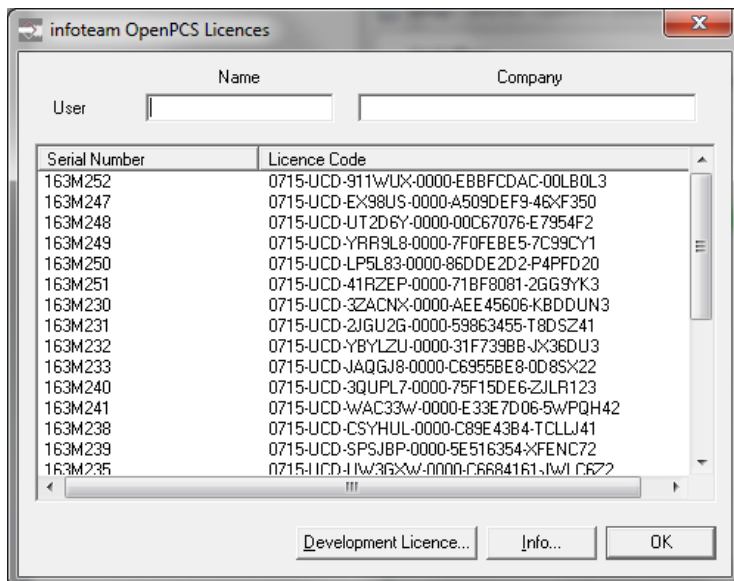


Figure 3: SYS TEC OpenPCS Extension Setup

Just insert your name and company into the “infoteam OpenPCS Licences” window and click “OK”.

- Finish the installation.

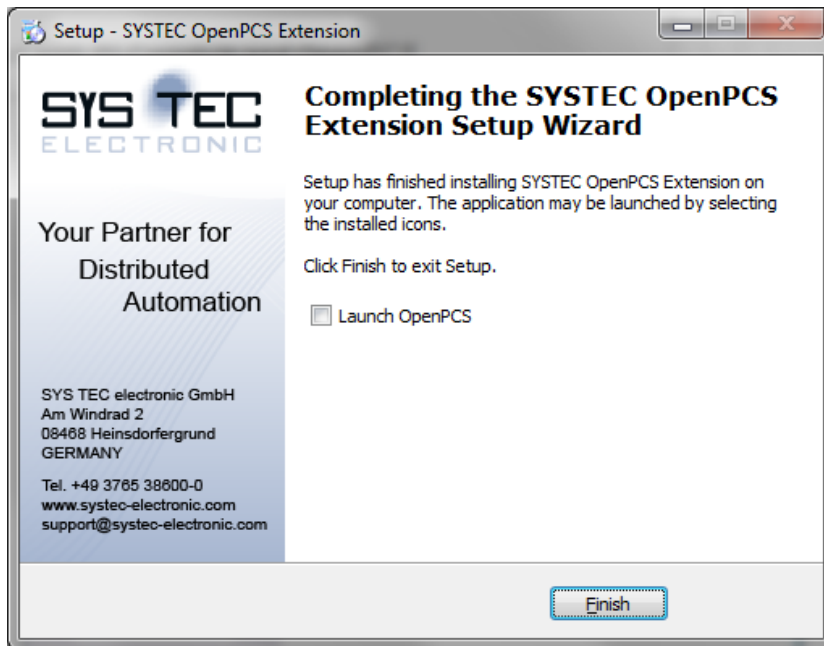


Figure 4: End of SYS TEC OpenPCS Extension Setup

- Close the dialog by clicking the “Finish”-Button.

3 OpenPCS Project Compilation and Download

This section will cover the following topics:

- How to start OpenPCS and open a project.
- How to setup the target connection
- How to compile the project.
- How to execute the program running on the target hardware.

3.1 Starting OpenPCS and Opening a Project

Step 1:

- Start OpenPCS by double clicking on the desktop icon or by selecting “Start” ⇒ “All Programs” ⇒ “infoteam OpenPCS 7.0” ⇒ “infoteam OpenPCS 7.0” (the correct path depends on the OpenPCS-version you have installed).

Step 2:

- OpenPCS starts with the most recent project. On the first start of a newly installed OpenPCS the SYS TEC demo project “Runlight” is preselected as most recent project and consequently opened automatically.
- Otherwise, already existing projects can be opened by the menu items “Project” ⇒ “Open...”.

3.2 Creating a new Target Connection

There are several options to establish a connection between OpenPCS and the target device. You can choose – related to your target – between:

- Ethernet (UDP/IP)
- CANopen
- RS232

For all cases, the first steps are identical:

Step 1:

- Select “PLC” → “Connections...” from the OpenPCS menu.
- In the dialog window “Connection Setup”, click the button “New”. The following window will be opened:

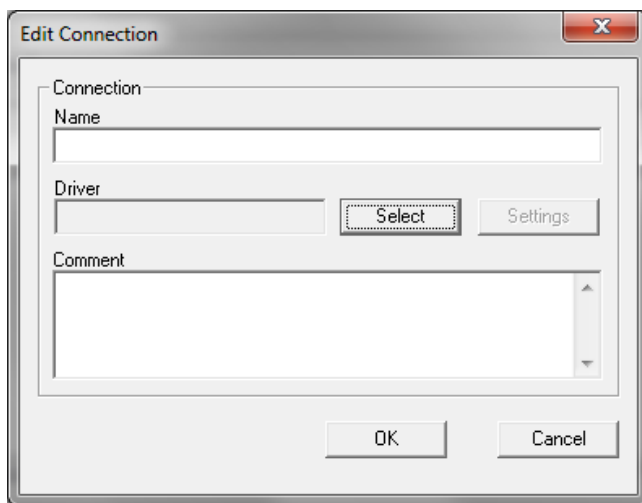


Figure 5: Target Connection - Edit Connection

Step 2:

- Click the “Select” button.
- Select “SYSTEC Standard Driver”. This driver is used for all kinds of connections to all SYS TEC PLCs.

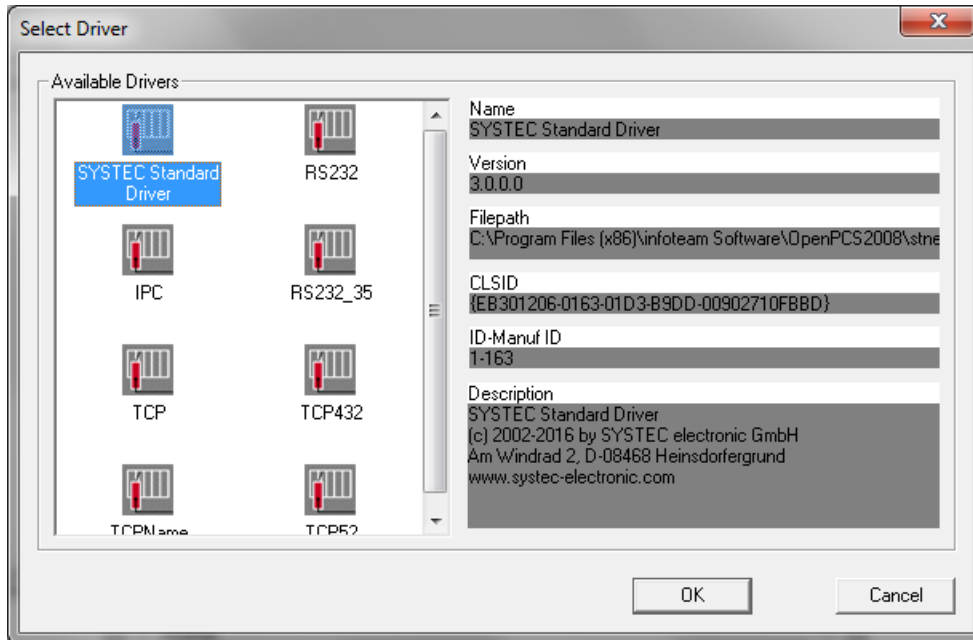


Figure 6: Target Connection - Select Driver

- Confirm the selection by clicking “OK”.

Step 3:

- Returning to the “Edit Connection” window, click “Settings”.

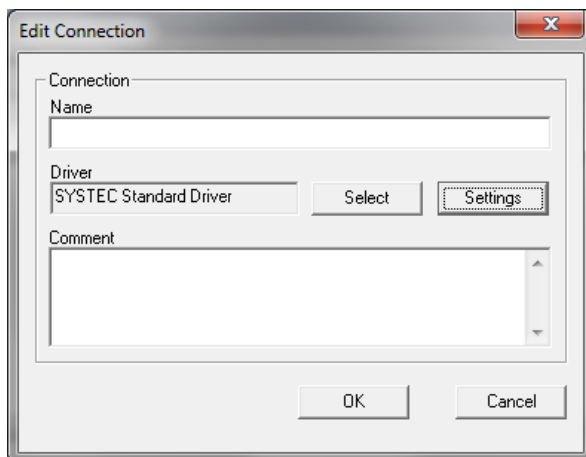


Figure 7: Edit connection

- Now you have to continue with connection type specific section:
 - Using UDP/IP -> continue with section 3.2.1
 - Using CANopen -> continue with section 3.2.2
 - Using RS232 -> continue with section 3.2.3

3.2.1 Using UDP/IP

After successfully creating a new connection as described in section 3.2, follow these steps to configure an UDP/IP connection:

Step 1:

- For connection configuration choose “UDP/IP” as the Network Protocol in the following dialog window.

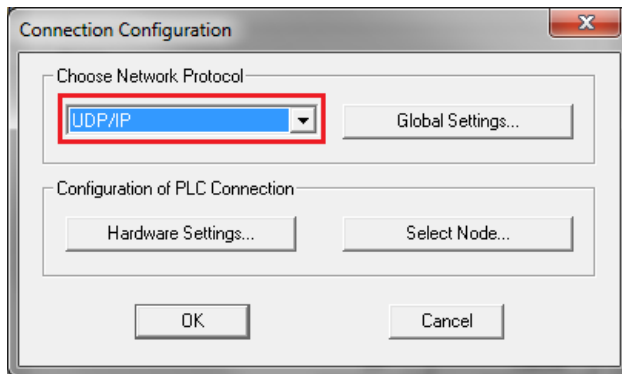


Figure 8: Connection Configuration for UDP/IP

Step 2:

- Open the “Select Node” dialog by clicking “Select Node...”.
- Select the IP address of the PLC device attached to your development PC. In this example the device IP address is **192.168.10.241**.
- Keep the port number at **8888** for standard connections.

Note:

Finding out the IP-Address of your target device depends on its type. For further information about this topic, please refer to device specific system manual.

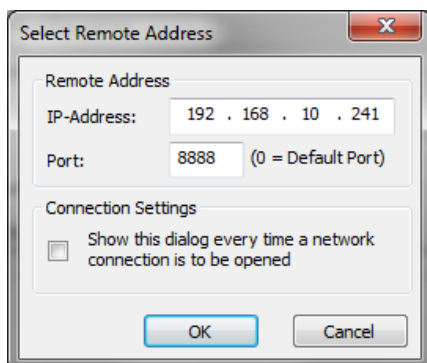


Figure 9: UDP/IP - Select Remote Address

- Close the last two dialog windows by clicking “Ok”.

Step 3:

- Enter a meaningful name for the connection settings, e.g. “*PLC_UDP_192_168_10_241*”. This name will be used later to assign a network connection to a PLC resource (see section 3.3):

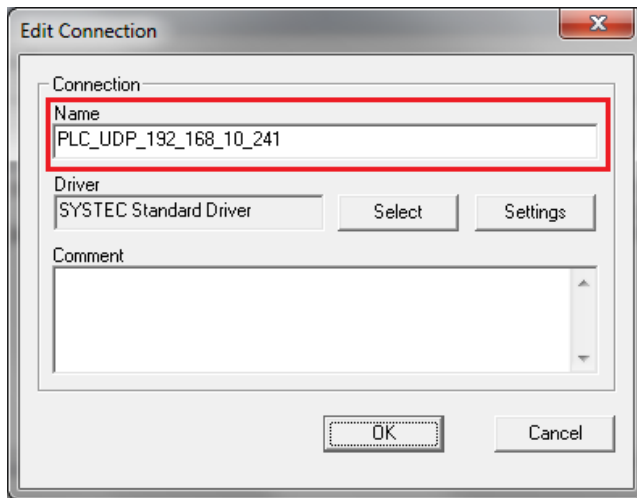


Figure 10: UDP/IP - Target Connection (filled)

- Finish the configuration of the target connection by clicking “OK” in the “*Edit Connection*” dialog and “Close” in the “*Connection Setup*” window.
- If you don't want to add another connection, please continue with section 3.3

3.2.2 Using CANopen

After successfully creating a new connection as described in section 3.2, follow these steps to configure a CANopen connection:

Step 1:

- For connection configuration choose “CANopen” as the Network Protocol in the following dialog window.

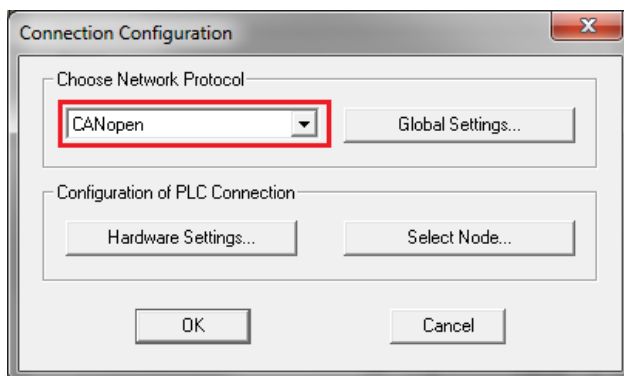


Figure 11: Connection Configuration for CANopen

Step 2:

- Open the “Hardware Setup” dialog by clicking “Hardware Settings...”

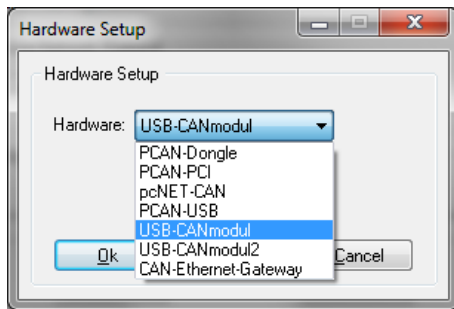


Figure 12: CAN Hardware Setup

- Here you can choose the CAN hardware connected to your PC for communication with your target device. In this example the USB-CANmodul is used.

Step 3:

- Now you can parameterize the selected hardware by clicking on “Properties” Button

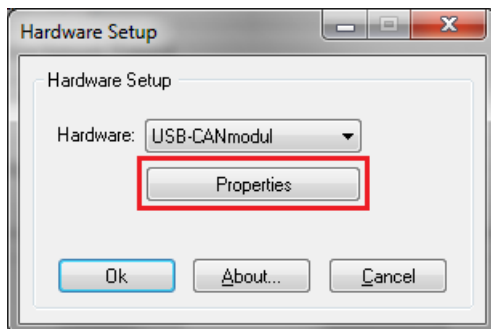


Figure 13: CANopen - Hardware Properties

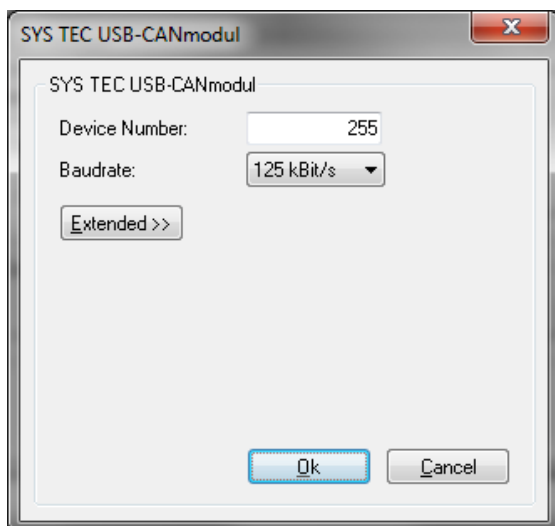


Figure 14: CANopen - Hardware Specific Parameter

- The hardware specific parameter dialog for USB-CANmodul is displayed. Select the CAN baud rate and the “Device Number” of the USB-CANmodul.

Notes:

- The baud rate depends on your target device. Please refer to device specific user manual.
- A “Device Number” set to 255 means **any** USB-CANmodul and is a good choice if only one USB-CANmodul is connected to the PC.
- Click “Ok” for leaving the “SYS TEC USB-CANmodul” dialog.
- Click “Ok” for leaving “Hardware Setup” Dialog

Step 4:

- Open the “Select Node” dialog by clicking “Select Node...” in the “Connection Configuration” dialog.

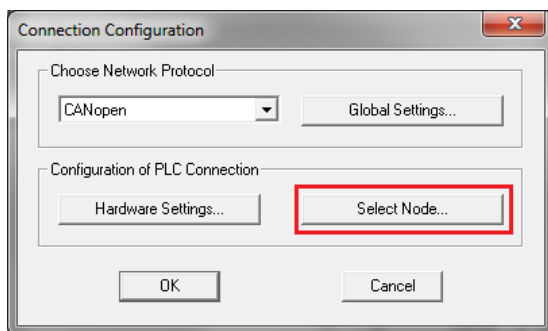


Figure 15: CANopen - Selecting Node

- Select the CANopen “Node Address” of the PLC device attached to your development PC. In this example the node address is set to 0x20 (32 dec).

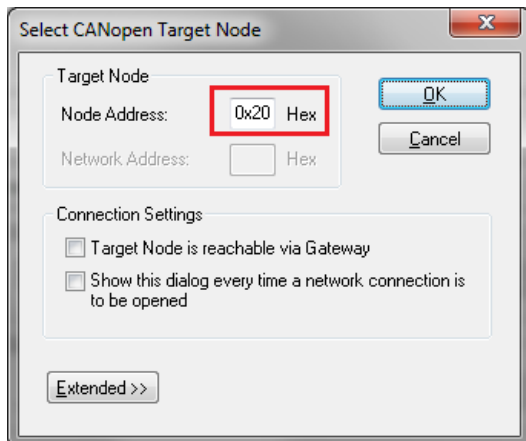


Figure 16: CANopen - Select Node Address

- Close the last two dialog windows by clicking “Ok”.

Step 5:

- Enter a meaningful name for the connection settings, e.g. “PLC_COP_0x20”. This name will be used later to assign a network connection to a PLC resource (see section 3.3):

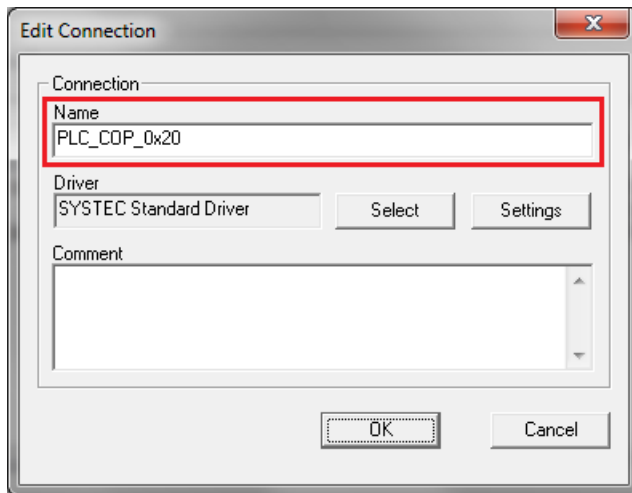


Figure 17: CANopen - Target Connection (filled)

- Finish the configuration of the target connection by clicking “OK” in the “Edit Connection” dialog and “Close” in the “Connection Setup” window.
- If you don't want to add another connection, please continue with section 3.3

3.2.3 Using RS232

After successfully creating a new connection as described in section 3.2, follow these steps to configure a RS232 connection:

Step 1:

- For connection configuration choose “RS232” as the Network Protocol in the following dialog window.

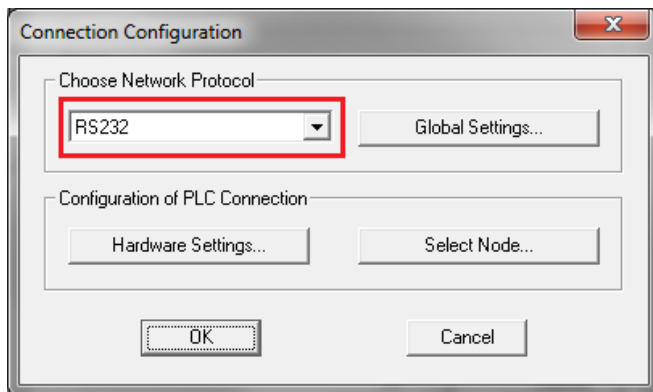


Figure 18: Connection Configuration for RS232

Step 2:

- Open the “Hardware Setup” dialog by clicking “Hardware Settings...”

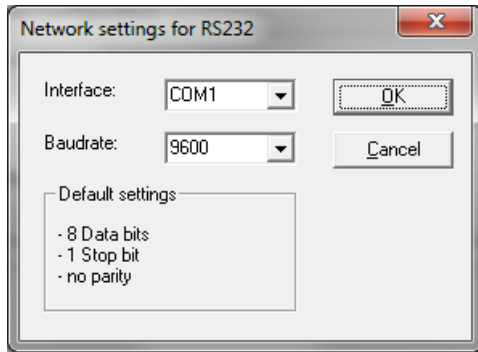


Figure 19: RS232 – Select Network Settings

- Select the serial port, e.g. COM1, and the baud rate.

Note:

The baud rate depends on your target device. Please refer to device specific user manual.

- Click “OK” for leaving this dialog
- In the “Connection Configuration” dialog click “Ok” again to return to “Edit Connection” dialog.

Step3:

- Enter a meaningful name for the connection settings, e.g. “PLC_RS232_COM1_9600”. This name will be used later to assign a network connection to a PLC resource (see section 3.3):

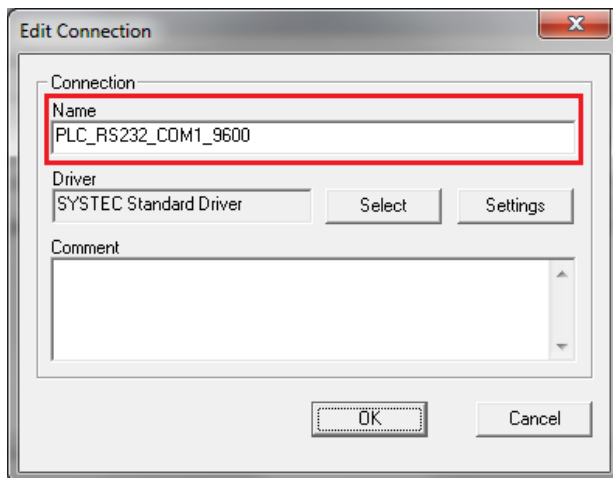


Figure 20: RS232 - Target Connection (filled)

- Finish the configuration of the target connection by clicking “OK” in the “Edit Connection” dialog and “Close” in the “Connection Setup” window.
- If you don't want to add another connection, please continue with section 3.3

3.3 Assign the connection to the PLC resource

Step 1:

- Select “PLC” ⇒ “Resource Properties...” from the OpenPCS main menu.
- Choose your target hardware in the “Hardware Module” setting and one of the network connections which have been created in the previous sections. In this example a PLCcore-5484 with UDP connection is used.

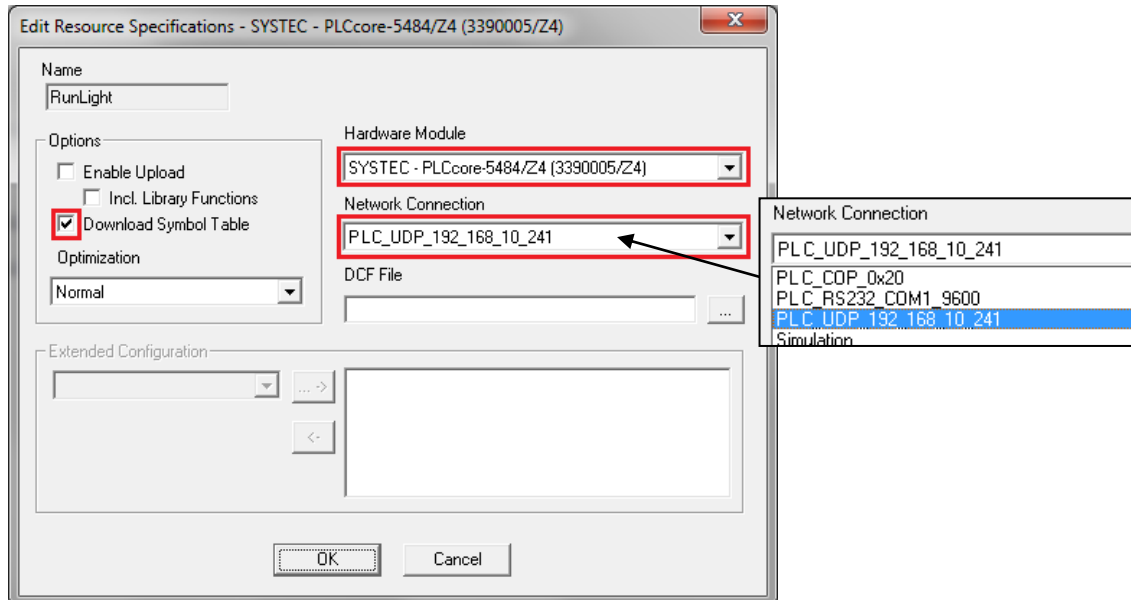


Figure 21: Resource Properties

- Option “**Download Symbol Table**”
The option “*Download Symbol Table*” is mandatory for all targets with visualization (target visualization as well as WEB-based visualization). For all targets without visualization this option is not necessary and can be deselected to save backup memory on target side.
- Confirm the settings by clicking “OK”.

Now you can continue with compilation and downloading of your PLC program to the target.

3.4 Compile the Project

Step 1:

- Use either the entry “PLC” ⇒ “Rebuild Active Resource” from the main menu or click at the appropriate icon as shown in the screenshot:

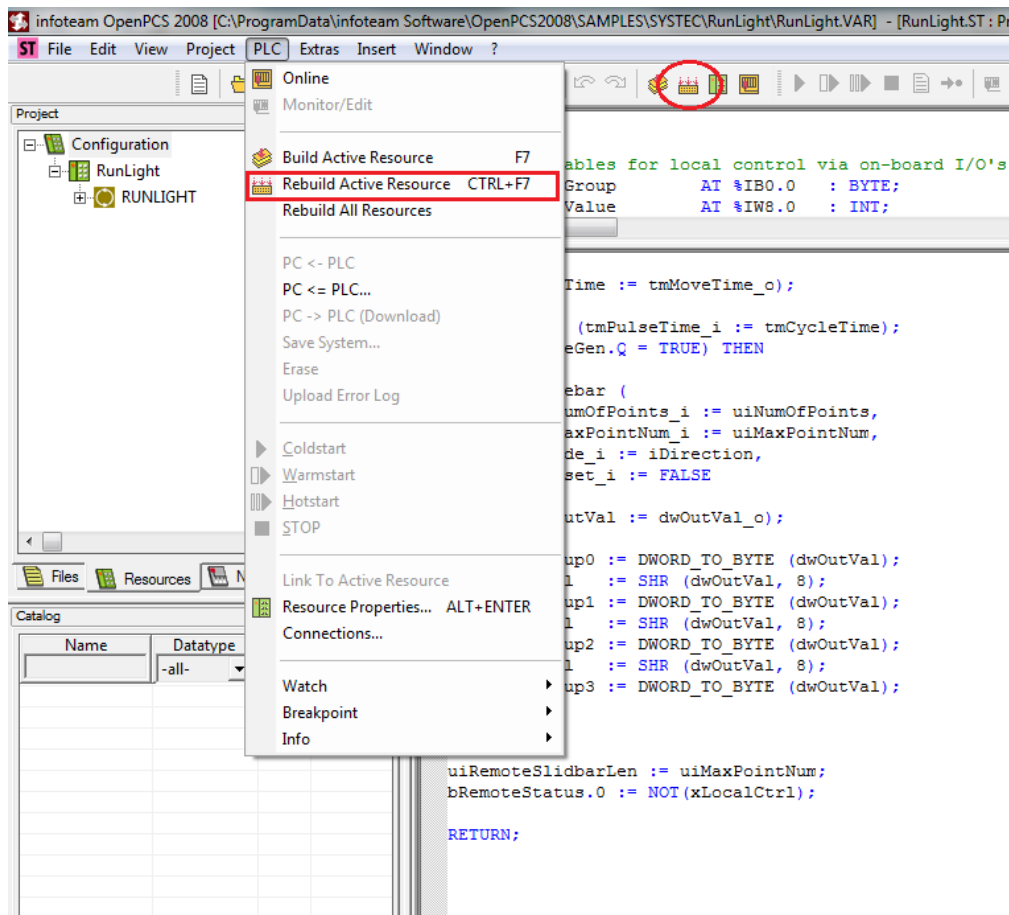


Figure 22: OpenPCS - Rebuild Active Resource

3.5 Downloading the Program to the PLC Device

Step 1:

- Start the download to the PLC device by selecting “PLC” ⇒ “Online” from the main menu.
- Confirm downloading the new user PLC program to the PLC device:

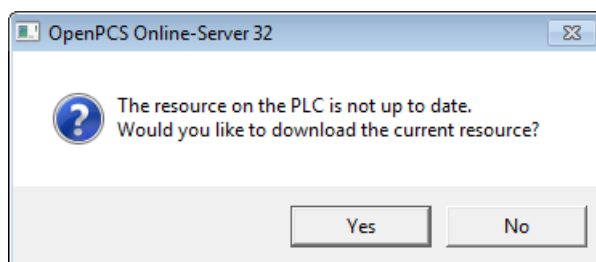


Figure 23: Download – Confirmation

Step 2:

- After the download has been completed, select “PLC” ⇒ “Coldstart” to start the downloaded PLC program. On your target device you should see a running light at the LEDs.

The downloaded PLC program is stored on the device. So if you are going to reboot the device in "Run" mode, the program will start automatically.

You now successfully started up with your PLCmodule and OpenPCS.

4 Running and Debugging the PLC Program

4.1 Run a PLC Program

After you compiled and downloaded your program successfully like described in section 3.4 and 3.5 you can start and stop your program directly via the OpenPCS application. For doing this you can use the buttons in the tool bar or the menu options in the PLC menu.

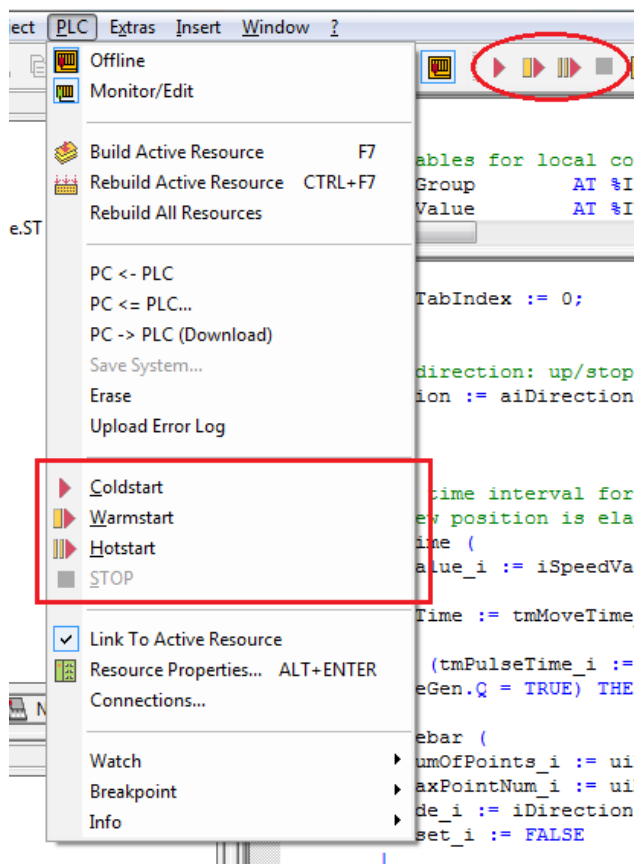


Figure 24: Start resp. Stop the PLC Program

Note:

Depending on the start type there will be different behaviour of the target:

- **Coldstart:** All variables of the PLC program are reset to their default values (including variables defined as "Retain")
- **Warmstart:** All variables of the PLC program, except the variables defined as "Retain" are reset to their default values
- **Hotstart:** No variables of the PLC program are reset (all variables keep their current values from previous executed cycles)

After a program download all variables are initialized to their default values so there is no difference between Cold-, Warm- and Hotstart for the first time after the program download.

4.2 Debug the PLC program

4.2.1 Using a Breakpoint

Step 1:

- Set the cursor to the line where you want to stop the program execution.

Step 2:

- Set a break point to the line by using the menu option “PLC” ⇒ “Breakpoint” ⇒ “Toggle” or use the button at the toolbar.

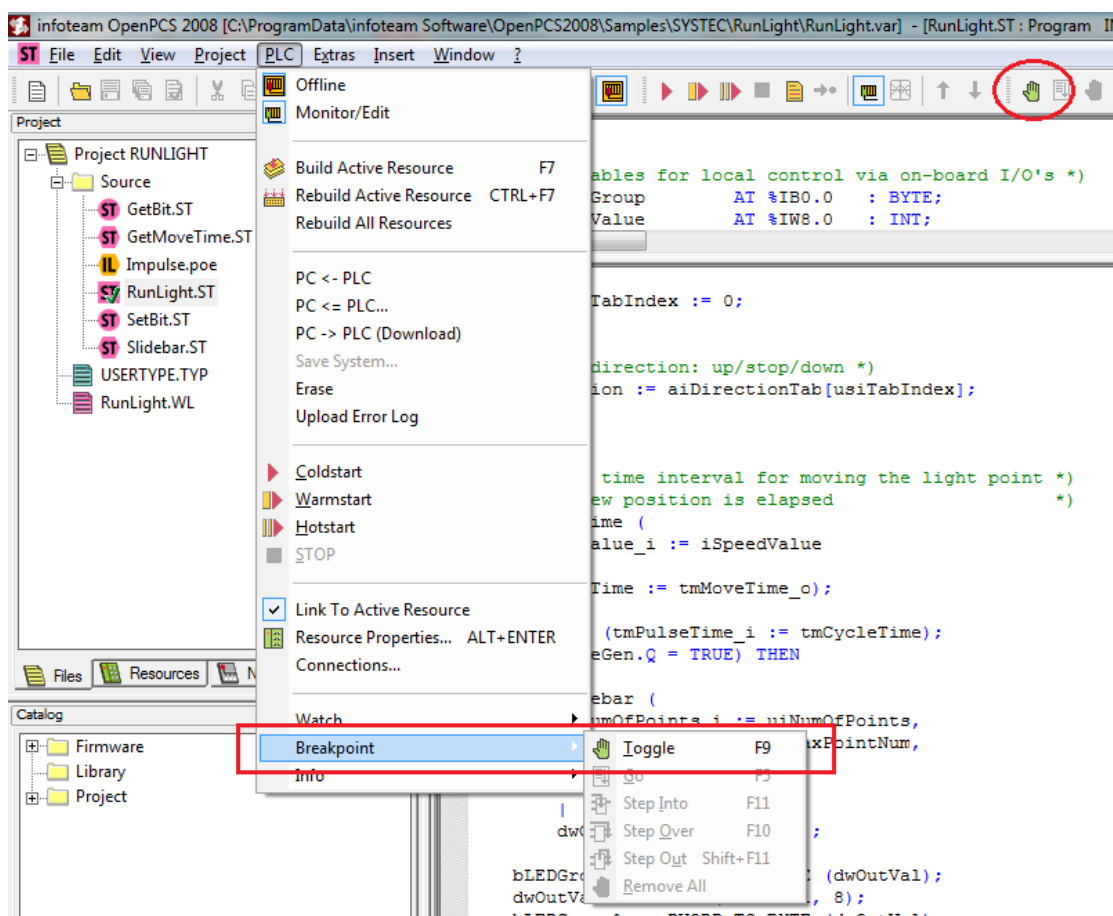


Figure 25: Toggle a Breakpoint

- After toggling the break point your selected line is marked with a red point and looks like following:

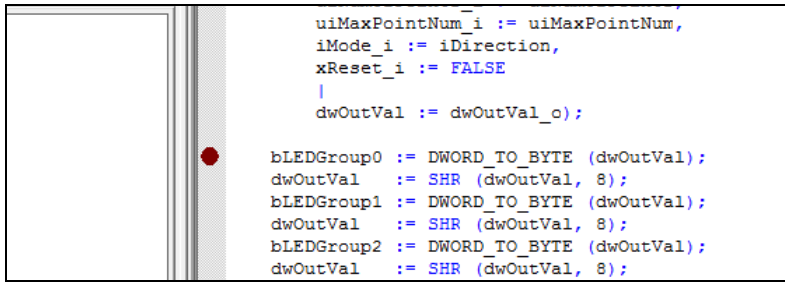


Figure 26: Toggled Breakpoint

Step 3:

- Now, if the program execution passes the line at the break point it will stop immediately.
- A yellow arrow indicates the execution stop at the marked line.
- You are now able to look at the current value of several variables (e.g. by tooltip or by using the Watchlist).

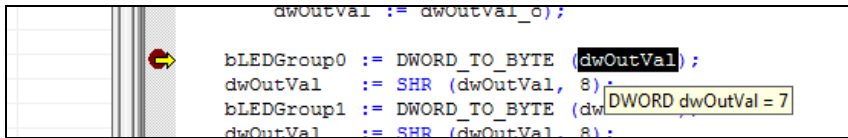


Figure 27: Stop at break point

Step 4:

- To continue with program execution there are several possibilities. You either can continue execution until the next breakpoint is hit by using "PLC" ⇒ "Breakpoint" ⇒ "Go" (or by using the according Button in the toolbar) or you can continue step by step. For Step-by-Step execution use "Step Into" or "Step Over" in menu "PLC" ⇒ "Breakpoint".

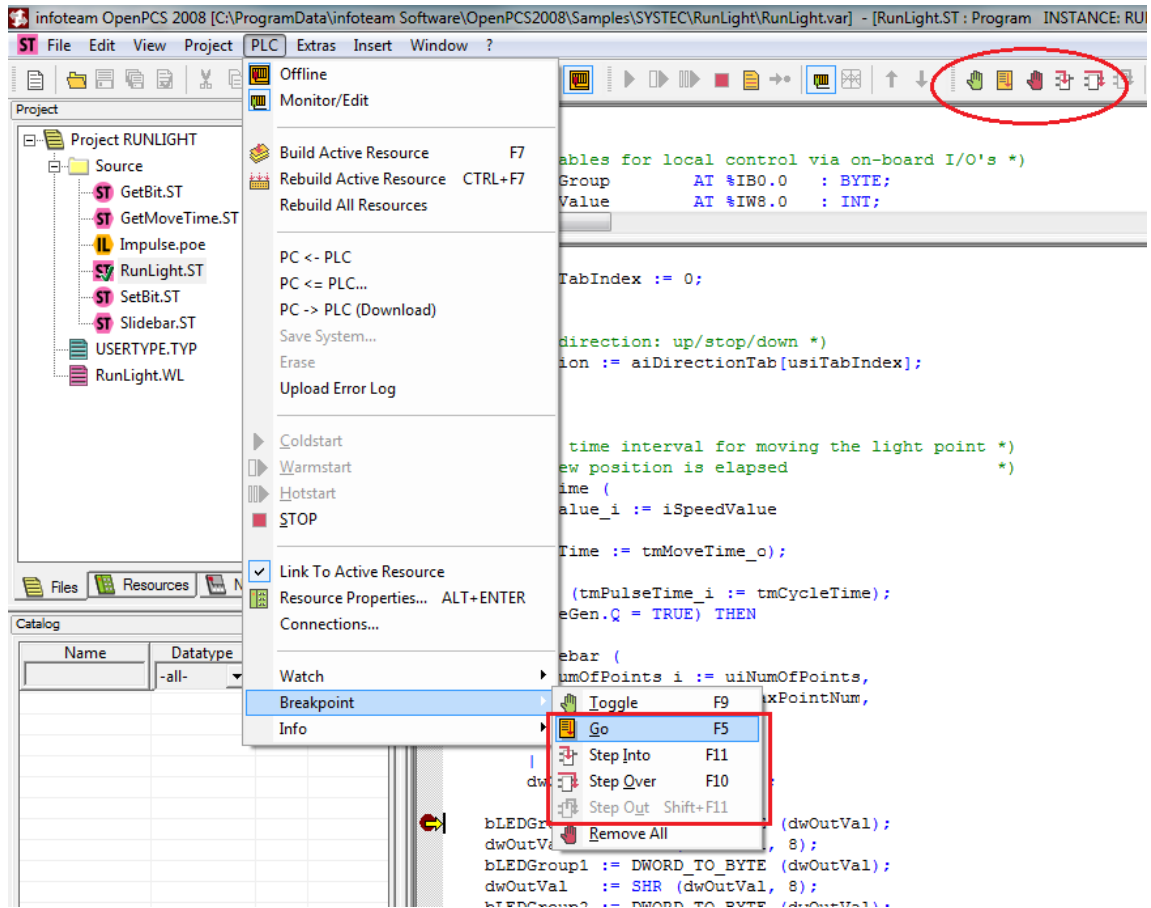


Figure 28: Continue at Breakpoint

Step 5:

- For continuous execution you can remove the Breakpoint by using the "Toggle" option on the selected line again. So the red breakpoint disappears.

4.2.2 Using the Watchlist

Step 1:

- Switch to "Resources" view by clicking on resources in the "Project" window:

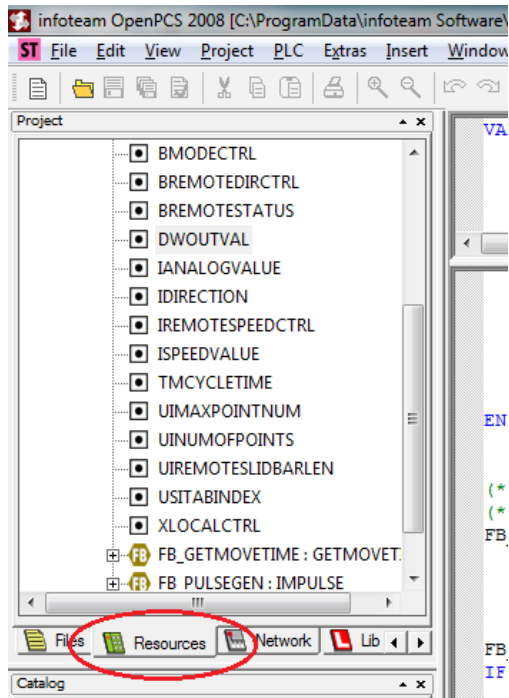


Figure 29: Resources View

Step 2:

- Look for the variable you are interested in.
- Right click on it and select “Add To Watchlist” in the context menu.

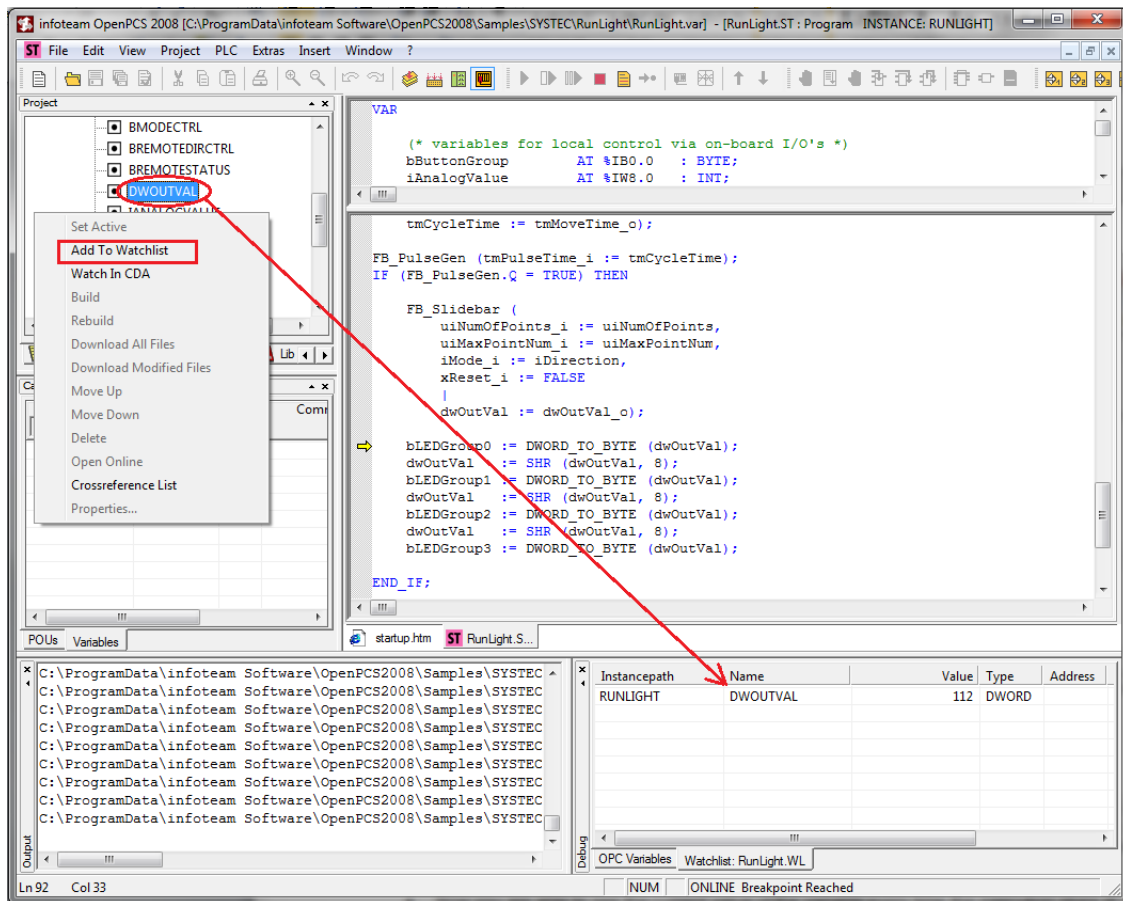


Figure 30: Add To Watchlist

- Now you are able to see the current value of the variable in your Watchlist. It refreshes in real time after each executed PLC cycle.

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